

# THE VASCULAR FLORA OF RATTLESNAKE FALLS: A POTENTIAL STATE NATURAL AREA ON THE WESTERN HIGHLAND RIM ESCARPMENT IN TENNESSEE

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## ABSTRACT

Rattlesnake Falls is located in the dissected Western Highland Rim Escarpment of Maury County, Tennessee. The central feature of this site is the largest known waterfall on the escarpment which falls 18 m over two ledges into a large splash pool at the head of a narrow, wooded gorge. The waterfall is surrounded by a 62.5 ha tract of rugged, mostly forested land, in which a botanical survey was conducted from February 2000 to August 2001. Six hundred twenty-seven taxa representing 348 genera and 107 families were found. 81 taxa (13%) were introduced. Families with the largest numbers of species were Asteraceae, Poaceae, and Fabaceae. County records (294) increased the number of plant taxa of Maury County to 915. Rare taxa included the federally threatened species *Helianthus eggertii* and tentatively, *Apios priceana*. Species listed at the state level as threatened were *Lilium michiganense* and *Juglans cinerea*, and as special concern were *Castanea dentata*, *Parnassia grandifolia*, *Phlox pilosa* ssp. *ozarkana*, and *Symphyotrichum oolentangiense*. Compared to 13 other floristic studies in various physiographic regions of Tennessee, Rattlesnake Falls had the second highest numbers of native and rare taxa per ha but also the second highest number of nonnative taxa per ha.

## RESUMEN

Las Rattlesnake Falls se localizan en el Western Highland Rim Escarpment del condado de Maury, Tennessee. La característica principal de este lugar es la gran cascada que cae 18 m por dos repisas en un gran estanque de salpicadura en la cabecera de una garganta boscosa estrecha. La cascada está rodeada por una extensión de tierra accidentada de 62.5 ha en su mayoría forestal, en la que se realizó un estudio botánico desde febrero de 2000 hasta agosto 2001. Se encontraron seiscientos veintisiete taxa de 348 géneros y 107 familias; 81 taxa (13%) eran introducidos. Las familias con mayor número de especies fueron Asteraceae, Poaceae, y Fabaceae. Las citas del condado (294) incrementaron el número de taxa vegetales del condado de Maury a 915. Los taxa raros incluidos en las especies federalmente amenazadas son *Helianthus eggertii* y tentativamente, *Apios priceana*. Las especies listadas a nivel estatal como amenazadas son *Lilium michiganense* y *Juglans cinerea*, y con especial preocupación *Castanea dentata*, *Parnassia grandifolia*, *Phlox pilosa* ssp. *ozarkana*, y *Symphyotrichum oolentangiense*. Comparado con otros 13 estudios florísticos en varias regiones fisiográficas de Tennessee, las Rattlesnake Falls tienen el segundo mayor número de taxa nativos y raros por hectárea, pero sólo el segundo número más alto de taxa no nativos por hectárea.

## INTRODUCTION

Rattlesnake Falls, with its encompassing tract of rugged, mostly forested land, is located in southwestern Maury County, Tennessee. Since the late 1800s, it has been a popular recreational landmark (Garrett 1966). In 1874, the name of the waterfall was changed to Antoinette Falls in honor of the Columbian socialite Antoinette Polk, daughter of the wealthy Civil War blockade-runner Captain Andrew Jackson Polk (Turner 1955). However, the name Rattlesnake Falls was too firmly entrenched and the new name was soon discarded. The original name apparently was reasonable given the abundance of snakes reported from the area (Garrett 1966).

Quarterman and Powell (1978) listed Rattlesnake Falls as a potential geological and ecological landmark of the Interior Low Plateaus Physiographic Province. Ecologically, they noted that the ravine was the "best" one they had surveyed on the Western Highland Rim and was nationally significant. Moreover, Rattlesnake Falls is one of the tallest waterfalls (ca. 18 m) in this region of Middle Tennessee (Tennessee Valley Authority 1938).

The purpose of the present study was to document the vascular flora of the tract of land surrounding Rattlesnake Falls. Communities were qualitatively described. The community and relative abundance were recorded for each taxon. In particular, the presence and status of rare plants, their habitat, and potential threats to their continued existence, were determined in order to augment the evaluation of the site as an important natural area deserving protection.

## STUDY AREA

Rattlesnake Falls is located ca. 27 km southwest of Columbia, near Summertown, in Maury County, Tennessee (centered 35°27'00" N, 87°15'38" W). The study unit included 62.5 ha (Fig. 1). It was bound by United States Highway 43 on the west, at about mid-slope on the eastern side of Falls Creek, and in major ravines north and south of Rattlesnake Falls Creek Gorge. The major tributary is an unnamed stream (hereafter referred to as Rattlesnake Falls Creek) formed by three streams merging approximately 300 m upstream from the Falls. Elevations within the study site range from 243 m along Falls Creek, to 304 m above mean sea level, at the ridgetops (Marcher & Lounsberry 1966).

Encompassing Rattlesnake Falls Gorge are two narrow ridges that roughly parallel one another in a west-east direction. Rattlesnake Falls Creek bisects these ridges, resulting in a deep, narrow gorge with steep-sided slopes descending directly to the margin of Rattlesnake Falls Creek in most places. Throughout the gorge, these steep slopes have rugged rock outcrops and small bluffs, and only in a few places adjacent to the creek may level to slightly sloping alluvial deposits be found. Two small caves are located on the north side of Rattlesnake Falls Creek near its confluence with Falls Creek. A cave spring occurs on

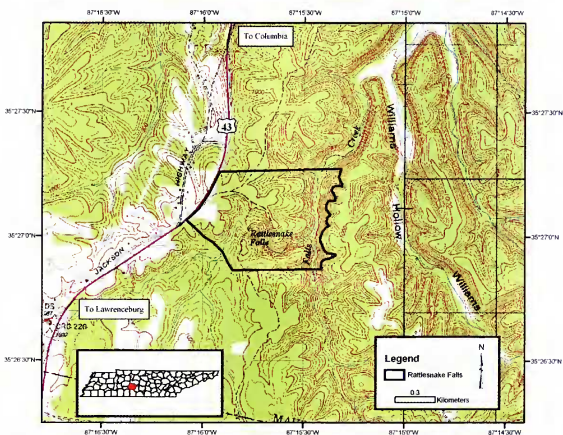


FIG. 1. Location of Rattlesnake Falls, and boundaries of the study area (Summertown USGS topographic quad).

the north side of Rattlesnake Falls Creek approximately 100 m upstream from Rattlesnake Falls.

The site is within the Highland Rim Escarpment portion of the Duck River Basin Subsection, Central Basin Section of the Interior Low Plateaus Physiographic Province (Quarterman & Powell 1978). This area represents the interface of the Western Highland Rim (71f) and the Outer Nashville Basin (71h) of Griffith et al. (1998). Strata of the Mississippian-aged Fort Payne Formation underlie most of the study area. The Fort Payne Formation consists of limestone with cherty and siltstone facies. Only along Falls Creek is limestone of Ordovician-aged Leipers and Catheys Formations exposed (Marcher & Lounsbury 1966; Quarterman & Powell 1978).

Four land/soil types are found in the study area (Harmon et al. 1959): Riverwash, Rockland, Bodine series, and Mountview series. Riverwash is in a very narrow band along Rattlesnake Falls Creek and Falls Creek. This land type mostly occurs along swift, forested streams and contains a mixture of chert, other rock fragments, and soil particles that have washed down from adjacent slopes. The steep Rockland land type of Harmon et al. (1959) is found along the edges of Rattlesnake Falls Gorge and ascends from the bottom nearly to the

ridge-tops in some localities and varies in slope from 12–60% with occasional vertical rock cliffs present on lower slopes of the gorge. The Rockland type is characterized by well-drained shallow soil. Portions of the slopes of the gorge below Rattlesnake Falls and of the small ravines, as well as the narrow ridgetops, are composed of cherty silt loam of the Bodine series. These soils have slopes that vary from 4–60%, and are strongly to very strongly acid, well drained, and cherty. The Mountview series occurs in the highest elevated areas of the study site. This soil series is a silt loam or silty clay loam, has slopes that range from 0–12%, and soils that are low in fertility and highly acidic (Harmon et al. 1959).

The study site is in Köppen's Cfa climatic type, i.e., a mild rainy climate with hot summers but without a distinct dry season (Ackerman 1941). In Maury County, the average growing season is 192 days and extends from April 12 to October 21. The mean annual temperature is 15.3°C. July is typically the hottest month with an average temperature of 25.6°C, while January is the coldest with an average temperature of 4.9°C. Annual precipitation totals 128.6 cm. Snowfall is about 20.1 cm. January and March are the wettest months, while September and October are the driest (Harmon et al. 1959).

The study site lies within Braun's (1950) Western Mesophytic Forest Region and Kùchler's (1964) Oak-Hickory Vegetation Type. Generally, ridge and slope forests are oak-dominated and ravines contain forests characterized as mesophytic (Bryant et al. 1993; Chester 1995).

#### METHODS

The study site was regularly sampled from late February 2000 to mid-November 2000 and from March 2001 to August 2001 with about three visits per month. Ten trips also were made during 1998 and 1999, prior to the beginning of the project. Thus, the site was visited during 55 trips over the entire study period. The area sampled included the gorge that contains Rattlesnake Falls, the ridges adjacent to the falls and associated ravines, a section along Falls Creek, the access road and trails leading to the falls, and an upland field near the northern edge of the study site. Vouchers for all but 14 species encountered during fieldwork were collected.

Identifications were made using standard manuals: Small (1933), Fernald (1950), Radford et al. (1968), Cronquist (1980), Isely (1990), Gleason and Cronquist (1991), and Yatskievych (1999). County records were determined using Chester et al. (1993, 1997). Specimens were deposited in herbaria of the University of Tennessee-Knoxville (TENN), Vanderbilt University (VDB) now housed at the Botanical Research Institute of Texas (BRIT), and/or Austin Peay State University (APSC). Element occurrence records for federal and state-listed rare species were provided to the Tennessee Division of Natural Heritage and to the Natural Resources Division of the Tennessee Valley Authority to aid in the protection of rare plant populations within the study area.

A literature search was performed to compile a list of other floristic studies from Tennessee; 13 of these were selected for comparison with Rattlesnake Falls. The numbers of native and nonnative taxa were calculated, and the floristic lists examined for rare species (cf. Tennessee Natural Heritage Program 2001). The numbers of taxa were converted to an area basis according to the area published in the study.

## RESULTS AND DISCUSSION

### Floristic Summary

Based on 938 collections, a total of 627 species and infraspecific taxa from 348 genera and 107 families comprise the known vascular flora of Rattlesnake Falls. Families containing the largest number of taxa were the Asteraceae (94), Poaceae (69), and Fabaceae (44). These families also are among the largest in the flora of Tennessee (Wofford & Kral 1993). Trees, shrubs, and woody vines accounted for 135 species (21% of the flora), with the greatest numbers of taxa in the following genera: *Quercus* (11), *Carya* (5), and *Rubus* (5). The following genera each had four woody taxa: *Cornus*, *Smilax*, *Ulmus*, *Vaccinium*, and *Vitis*. *Acer*, *Celtis*, *Crataegus*, *Hypericum*, *Rhododendron*, *Rhus*, *Rosa*, and *Salix* each had three taxa. There were 492 (78%) herbaceous species in the flora. The largest genera of herbaceous plants (15%) were *Carex* (19), *Solidago* (14), *Dichanthelium* (11), *Desmodium* (9), *Lespedeza* (9), *Symphytotrichum* (9), *Eupatorium* (7), *Polygonum* (7), and *Viola* (7). Twenty-seven (4%) ferns and fern-allies were present. Ten state rare taxa, including two federally listed species, were found. Five hundred forty-six taxa were native (87%) and 81 taxa (13%) were not native. County records (294) increased the number of plant species and subspecific taxa in Maury County from 621 to 915.

### Plant Communities

Six communities were recognized at Rattlesnake Falls, delineated mostly along topographical contours and physical aspect. The most extensive, comprising approximately 50% (31 ha) of the study area, and least floristically diverse was the oak-hickory forest of the upland ridgetops and upper slopes of ridges. Ravine forest, occupying 43% (27 ha), was the most floristically diverse. An old field at the western edge of the site was about 1 ha (2%). The remaining three communities, representing ca. 5% (2 ha) of the study area, included bluff or rock outcrop areas, calcareous seeps, and disturbed sites.

**Oak-Hickory Forests.**—The canopy of the oak-hickory forest was dominated primarily by *Quercus alba*, *Q. coccinea*, *Q. prinus*, *Q. stellata*, and *Q. velutina* and by *Carya alba* and *C. glabra*. On xeric slopes and ridgetops, individuals of *Q. marilandica*, *Pinus echinata* and *P. virginiana* were present. The subcanopy and shrub layer were dominated by *Amelanchier arborea*, *Nyssa sylvatica*, and various ericaceous species. *Smilax* spp. and *Toxicodendron radicans* were common

woody vines. Notable herbaceous species included *Antennaria plantaginifolia*, *Auricularia pectinata*, *Carex picta*, *Cunila origanoides*, *Desmodium rotundifolium*, *Ionactis linariifolius*, *Lechea tenuifolia*, *Lespedeza procumbens*, *Spiranthes tuberosa*, and *Viola hirsutula*.

**Ravine Forests.**—A much greater abundance and diversity of plants distinguished the ravine forest from the oak-hickory forest. The difference in floristic diversity and composition was most likely correlated with moisture availability. The dominant canopy species in the ravine forest included a wider representation of genera than in the oak-hickory forest. Common species were *Acer saccharum*, *Liriodendron tulipifera*, and *Quercus muehlenbergii*. Small trees and shrubs that comprised the understory included *Asimina triloba*, *Carpinus caroliniana*, *Cornus alternifolia*, *Hamamelis virginiana*, *Hydrangea cinerea*, *Lindera benzoin*, and *Staphylea trifolia*. The diversity and abundance of herbaceous species was particularly impressive in the portion of the gorge just downstream from the waterfall. Notable representatives included *Actaea pachypoda*, *Geranium maculatum*, *Maianthemum racemosum*, *Phlox divaricata*, *Solidago curtisii*, *Waldsteinia fragarioides*, and *Valeriana pauciflora*. More than 20 species of ferns and fern-allies were found. The bryoflora also was noted for its significance and diversity, particularly in the gorge near the waterfall (Quarterman & Powell 1978; P. Davison, pers. comm.).

**Old Fields.**—The floristic composition of the old field exhibited some characteristics of barrens (DeSelm 1994; Baskin et al. 1994): areas dominated by perennial grasses that are successional but maintained as open communities by anthropogenic disturbances. In fact, Rattlesnake Falls is located in the portion of southwestern Maury County that was included in the "barrens of the Southwestern Rim" floristic region by Shanks (1958; DeSelm 1988). The field was maintained by occasional mowing. Important grass species were *Andropogon virginicus*, *Dichanthelium* spp., *Panicum anceps*, *Saccharum alopecuroidum*, *Schizachyrium scoparium*, and *Tridens flavus*. Forbs were well represented by numerous species of *Desmodium*, *Helianthus*, *Lespedeza*, *Solidago*, and *Symphotrichum*. The field was undergoing succession with low-statured, dense growth of *Ceanothus americanus* and *Rhus copallinum*. Much of the field also contained invasive species like *Lespedeza bicolor*, *L. cuneata*, *Lolium arundinaceum*, *Lonicera japonica*, and *Rubus bifrons*.

**Bluffs and Rock Outcrops.**—Large boulders and rock promontories covered with shallow soil and open sparse vegetation characterized the bluff and rock outcrop community. The largest and best-developed section was located on the north side of Rattlesnake Falls Creek, downstream from the waterfall. Other bluff and rock outcrop communities were present throughout Rattlesnake Falls Gorge and along Falls Creek. Noteworthy species included *Hypericum frondosum*, *Philadelphus hirsutus*, *Aquilegia canadensis*, *Asclepias verticillata*, *Heuchera villosa* var. *macrorhiza*, *Parietaria pennsylvanica*, *Schizachyrium*

*scoparium*, *Sisyrinchium albidum*, *Asplenium resiliens*, *Cheilanthes lanosa*, and *Cystopteris bulbifera*.

**Calcareous Seeps.**—The calcareous seep community was characterized by an open canopy and gravelly, continuously waterlogged, substrate. Two types of seeps were found in the study area. The most common type was dominated by *Impatiens capensis*. A large *Impatiens* dominated seep was present on the steep slope adjacent to Rattlesnake Falls, and a few other ones were found along Falls Creek. The other type of seep was dominated by *Parnassia grandifolia*. One rather extensive *Parnassia* dominated seep was found on a steep slope on the eastern side of Falls Creek. Frequent species found in both seep types were *Alnus serrulata*, *Chelone glabra*, *Cuscuta compacta*, *Juncus coriaceus*, *Oxypolis rigidior*, *Phlox glaberrima*, *Rudbeckia fulgida* var. *umbrosa*, and *Solidago patula*.

**Disturbed Areas.**—Examples of disturbed areas included access (dirt) roads, trails, a campsite, and a recently constructed utility substation. They were subjected to regular human disturbance and often had higher numbers of non-native species compared to areas less frequented and affected by humans. Some of the common species included exotics, such as *Albizia julibrissin*, *Carduus nutans*, *Ligustrum sinense*, *Lolium arundinaceum*, *Lonicera japonica*, *Microrstegium vimineum*, *Paulownia tomentosa*, and *Rosa multiflora*. In Tennessee, these species are considered severe or significant threats to native plant communities (Tennessee Exotic Pest Plant Council 2002).

### Rare Plants

*Apios priccana* is listed as federally threatened and as endangered in Tennessee (Tennessee Natural Heritage Program 2001). Unfortunately, the plants at Rattlesnake Falls did not flower during the period of study, and the morphology of the flowers is the diagnostic identification feature. Vegetative characteristics and habitat were used to tentatively determine the identity of the plants (US Fish and Wildlife Service 1993; E.W. Chester, pers. comm.). About five clumps were found in two types of habitat in Rattlesnake Falls Gorge: a moist semi-open streambank and on a rocky wooded hillside. The individuals along the streambank were located close to a trail, and trampling might impact the population. Associated taxa included *Carya cordiformis*, *Quercus alba*, *Ostrya virginiana*, *Parthenocissus quinquefolius*, *Agrimonia rostellata*, *Dioscorea quaternata*, and *Passiflora lutea*.

*Helianthus eggertii* is listed as federally and state threatened (Tennessee Natural Heritage Program 2001). Many individuals were found along a dirt road as well as in the adjacent upland field. The area along the road was subjected to infrequent disturbance by vehicular traffic until a gate was erected at the road entrance in 1999. Consequently, the road margins where *H. eggertii* occurs are becoming overgrown. Moreover, the plants in the field may be shaded out due to encroachment of woody species if periodic mowing or prescribed fire is not

implemented. Prolonged absence of mowing has allowed the growth of *Lespedeza bicolor*, *Lonicera japonica*, *Rhus copallinum*, *Rubus bifrons*, and *Sassafras albidum*. Jones (1994) considered competition from weedy species, shading due to succession of habitat to woodland, and major soil disturbance events such as bulldozing to be the leading factors in population declines or extirpations of *H. eggertii*. In addition to the woody competitors mentioned above, other associated species, some of which Jones (1994) listed as typically occurring with *H. eggertii*, were found. These included *Coreopsis tripteris*, *Eurybia hemispherica*, *Helianthus hirsutus*, *Lespedeza virginica*, *Rudbeckia hirta*, *Silphium mohrii*, *Solidago ulmifolia*, *Symphyotrichum patens*, *Andropogon virginicus*, *Schizachyrium scoparium*, and *Tridens flavus*.

*Lilium michiganense* is listed as threatened in Tennessee (Tennessee Natural Heritage Program 2001). Three plants, only one in flower, were found upstream of Rattlesnake Falls and an additional five vegetative individuals were found downstream. The flowering specimen occurred along Rattlesnake Falls Creek on a wet bank with *Alnus serrulata*, *Impatiens capensis*, *Lycopus rubellus*, and *Oxypolis rigidior*. The remaining seven plants were found on a rich streambank and on a wooded alluvial flat. Associates included *Arundinaria gigantea*, *Corallorhiza wisteriana*, *Lindera benzoin*, *Phegopteris hexagonoptera*, *Platanthera peramoena*, and *Polystichum acrostichoides*.

*Juglans cinerea* is threatened in Tennessee (Tennessee Natural Heritage Program 2001) due to the fungal pathogen, *Simococcus clavignenti-juglandaccarum*, or Butternut Canker. This disease has caused a dramatic decline of the species throughout its range in eastern North America (Ostry 1997). Butternut was occasionally found in the ravine forests of the study area. Many older specimens showed signs of disease, but there were a few apparently healthy saplings.

*Symphyotrichum oolentangiense* is listed as special concern in Tennessee (Tennessee Natural Heritage Program 2001). The species previously was reported from two counties in the Coastal Plain physiographic region of Tennessee, and the collection from Rattlesnake Falls was the first from the Western Highland Rim of Tennessee (Chester et al. 1997). The plant was collected in low density oak-hickory woods on a xeric slope above Rattlesnake Falls.

*Parnassia grandifolia* is listed as special concern in Tennessee (Tennessee Natural Heritage Program 2001). Hundreds of plants were found growing densely in one calcareous seep with an area of approximately 25 m<sup>2</sup>. Associated species included *Alnus serrulata*, *Apios americana*, *Impatiens capensis*, *Salix caroliniana*, *Oxypolis rigidior*, *Phlox glaberrima*, *Rudbeckia fulgida* var. *umbrosa*, *Solidago patula*, and *Osmunda regalis* var. *spectabilis*.

*Phlox pilosa* ssp. *ozarkana* is listed as special concern in Tennessee (Tennessee Natural Heritage Program 2001). Only a few individuals were found in the upland field and edges adjacent to US Highway 43. The plants were growing with *Helianthus eggertii* and with *H. eggertii*'s previously mentioned associates.



The major threat to the population of this phlox at Rattlesnake Falls would be woody plant encroachment.

*Panax quinquefolius* is listed as special concern in Tennessee as a result of commercial exploitation (Tennessee Natural Heritage Program 2001). About 20 individuals were found in cherty, humus-rich soil of moist woods at scattered localities in Rattlesnake Falls Gorge and adjacent ravines.

*Hydrastis canadensis* is listed as special concern in Tennessee as a result of commercial exploitation (Tennessee Natural Heritage Program 2001). The population consisted of about 30 individuals located in three separate forested ravines.

*Castanea dentata*, once a prominent forest tree, is listed as special concern in Tennessee (Tennessee Natural Heritage Program 2001). It was found mostly in oak-hickory forests on dry ridges in the study area. Most of the specimens were small, with only a couple 5–15 cm in diameter. *Quercus alba*, *Q. coccinea*, *Q. prinus*, *Q. velutina*, *Carya alba*, *C. glabra*, *Nyssa sylvatica*, *Smilax rotundifolia*, *Toxicodendron radicans*, *Vitis aestivalis* var. *aestivalis*, and *Vitis rotundifolia* were common associates.

#### Comparison to Other Floristic Studies

Rattlesnake Falls had approximately 8.7 native and 1.3 nonnative taxa per ha, and 0.16 rare plants (Table 1). Compared to 13 other areas in Tennessee, Rattlesnake Falls had the second largest numbers of native, rare, and nonnative taxa per ha. Barnett Woods in Montgomery County, Tennessee had the largest numbers of native, rare, and nonnative taxa per ha. The average numbers of native, rare, and nonnative taxa per ha among these 13 studies were 0.63, 0.01, and 0.11, respectively.

#### ANNOTATED CHECKLIST

The following vascular plants represent the known flora of Rattlesnake Falls. They are arranged alphabetically by family within six groups: Lycopodiophyta, Equisetophyta, Polypodiophyta, Pinophyta, and Magnoliophyta, including the Magnoliopsida and Liliopsida. Nomenclature mostly follows Kartesz (1999) except for ferns, fern allies, and gymnosperms which follow the Flora of North America Editorial Committee (1993); recently described species follow Campbell (2000) and Naczi et al. (2001, 2002). Also, we depart from Kartesz (1999) in recognizing *Melilotus alba*, in accordance with the USDA, NRCS (2004), and *Dichanthelium dichotomum* var. *ramulosum* and *D. yadkinense* based on LeBlond (2001). The acceptance of *Heuchera villosa* var. *macrorrhiza* is based on Fernald (1950). County records are denoted by a cross (+) and non-native taxa are indicated by an asterisk (\*). Species native to portions of Tennessee but not to the study area are indicated by two asterisks (\*\*). Rare taxa are listed in **bold** type. Collection numbers are those of the senior author. For 14 specimens

TABLE 1. Comparison of the flora of Rattlesnake Falls with those of other study areas in Tennessee according to physiographic regions.

	Number of taxa (taxa per ha)		
	Native	Rare	Nonnative
<b>Highland Rim</b>			
Rattlesnake Falls	546 (8.72)	10 (0.160)	81 (1.296)
Barnett Woods <sup>1</sup>	400 (24.69)	4 (0.247)	43 (2.654)
Bear Creek <sup>2</sup>	610 (1.88)	9 (0.028)	123 (0.378)
Cross Creeks National Wildlife Refuge <sup>3</sup>	501 (0.14)	6 (0.002)	132 (0.037)
Land Between the Lakes <sup>4</sup>	915 (0.04)	28 (0.001)	247 (0.010)
Short Mountain <sup>5</sup>	401 (0.33)	3 (0.002)	76 (0.063)
<b>Cumberland Plateau</b>			
Fall Creek Falls State Park <sup>6</sup>	769 (0.09)	16 (0.002)	110 (0.012)
Obed Wild and Scenic River <sup>7</sup>	675 (0.17)	18 (0.004)	59 (0.015)
Savage Gulf <sup>8</sup>	636 (0.16)	17 (0.004)	44 (0.011)
Wolf Cove <sup>9</sup>	544 (0.54)	8 (0.008)	29 (0.029)
<b>Valley and Ridge</b>			
Oak Ridge Reservation <sup>10</sup>	708 (0.05)	19 (0.001)	134 (0.009)
Red Clay State Historical Area <sup>11</sup>	416 (3.96)	2 (0.019)	78 (0.743)
<b>Unaka Mountains</b>			
Big Frog Mountain <sup>12</sup>	458 (0.16)	17 (0.006)	21 (0.007)
Chilhowee Mountain <sup>13</sup>	825 (0.03)	20 (0.001)	128 (0.005)

<sup>1</sup>Chester (1986) – 16.2 ha, Montgomery County;<sup>2</sup>Carpenter and Chester (1987) – 325 ha, Stewart County;<sup>3</sup>Joyner and Chester (1994) – 3588 ha, Stewart County;<sup>4</sup>Chester (1993) – 25090 ha, only Stewart County;<sup>5</sup>McKinney (1986) – 1214 ha, Cannon County;<sup>6</sup>Fleming (2004) – 8900 ha, Bledsoe and Van Buren counties;<sup>7</sup>Schmalzer et al. (1985) – 4000 ha, Cumberland and Morgan counties;<sup>8</sup>Wofford et al. (1979) – 4047 ha, Grundy County;<sup>9</sup>Clements and Wofford (1991) – 1000 ha, Franklin County;<sup>10</sup>Mann et al. (1985) – 15000 ha, Anderson and Roane counties;<sup>11</sup>Houck (1990) – 105 ha, Bradley County;<sup>12</sup>Murrell and Wofford (1987) – 2843 ha, Polk County;<sup>13</sup>Thomas (1976) – 25899 ha, Blount and Sevier counties.

not collected, the words “not collected” are listed in parenthesis. Although several specimens were collected for many of the species and given separate collection numbers, only one number is given per taxon in this checklist. Unless otherwise indicated voucher specimens are deposited at TENN. A brief description of the habitat in which each species was collected is given. A qualitative assessment of the relative abundance of each taxon in their characteristic habitat was made, and classified as follows (Murrell & Wofford 1987):

Very rare	—a single locale, few individuals
Rare	—one or two localities, generally small populations
Scarce	—several localities or scattered small populations
Infrequent	—scattered localities throughout
Occasional	—well-distributed but not anywhere abundant
Frequent	—generally encountered
Common	—characteristic and dominant

**LYCOPODIOPHYTA****SELAGINELLACEAE**

*Selaginella apoda* (L.) Spring, wet rocks under waterfall; rare (00576).

**EQUISETOPHYTA****EQUISETACEAE**

†*Equisetum hyemale* L. ssp. *affine* (Engelm.) Calder & Roy L. Taylor, wooded streambank; rare (00302).

**POLYPODIOPHYTA****ASPLENIACEAE**

*Asplenium platyneuron* (L.) B.S.P., woods; frequent (00498).

*Asplenium resiliens* Kunze, limestone bluffs; very rare (03502).

*Asplenium rhizophyllum* L., limestone bluffs; frequent (01007).

**DENNSTAEDTIACEAE**

*Pteridium aquilinum* (L.) Kuhn var. *latiusculum* (Desvaux) L. Underwood ex A. Heller, old field and upland woods; occasional (01172).

**DRYOPTERIDACEAE**

*Athyrium filix-femina* (L.) Mertens var. *asplenioides* (Michx.) Farw., wooded ravines; common (00539).

*Cystopteris bulbifera* (L.) Bernh., limestone bluffs and boulders; frequent (00515).

*Cystopteris protrusa* (Weatherby) Blasdell, rich wooded ravine; very rare (01879).

†*Deparia acrostichoides* (Sw.) M. Kato, rich wooded ravines; rare (01356).

*Diplazium pycnocarpon* (Spreng.) Broun, rich wooded ravines; scarce (01355).

†*Dryopteris celsa* (W. Palmer) Knowlton, Palmer, & Pollard, calcareous seeps and moist streambank; scarce (01367).

†*Onoclea sensibilis* L., streambank; very rare (00891).

*Polystichum acrostichoides* (Michx.) Schott. var. *acrostichoides*, woods and ravines; common (00444).

*Woodsia obtusa* (Spreng.) Torr. ssp. *obtusa*, limestone bluff; scarce (02673).

**OPHIOGLOSSACEAE**

*Botrychium dissectum* Spreng., rich alluvial terrace; rare (01504).

*Botrychium virginianum* (L.) Sw., woods and ravines; frequent (00729).

†*Ophioglossum vulgatum* L., rich alluvial terrace; rare (01838).

**OSMUNDACEAE**

*Osmunda cinnamomea* L., rich wooded ravine; very rare (00537).

*Osmunda regalis* L. var. *spectabilis* (Willd.) A. Gray, calcareous seep and rich wooded ravine; rare (02532).

**POLYPODIACEAE**

*Pleopeltis polypodioides* (L.) Andrews & Windham ssp. *michauxiana* (Weath.) Andrews & Windham, limestone bluffs and boulders; infrequent (00319).

**PTERIDACEAE**

*Adiantum pedatum* L., rich wooded ravines; frequent (00482).

*Cheilanthes lanosa* (Michx.) D.C. Eaton, dry limestone bluffs; rare (00742).

*Pellaea atropurpurea* (L.) Link, dry limestone bluffs; scarce (00892).

**THELYPTERIDACEAE**

*Phegopteris hexagonoptera* (Michx.) Fée, rich wooded ravines; frequent (00538).

†*Thelypteris noveboracensis* (L.) Nieuwland, rich wooded ravine; very rare (01352).

*Thelypteris palustris* Schott var. *pubescens* (Lawson) Fernald, calcareous seeps; very rare (01245).

## PINOPHYTA

## CUPRESSACEAE

*Juniperus virginiana* L., dry limestone bluff and margin of old field; scarce (00633).

## PINACEAE

†*Pinus echinata* Mill., dry, thin upland woods; scarce (02677).

†\*\**Pinus taeda* L., old field margin; very rare (01487).

†*Pinus virginiana* Mill., dry wooded slope; very rare (00441).

## MAGNOLIOPHYTA

## MAGNOLIOPSIDA

## ACANTHACEAE

†*Ruellia caroliniensis* (J.F.Gmel.) Steud., old field and dry woods; occasional (00870).

## ACERACEAE

*Acer negundo* L., rich wooded ravine; very rare (01159).

†*Acer rubrum* L. var. *trilobum* Torr. & A. Gray ex K.Koch, upland woods; frequent (00534).

*Acer saccharum* Marshall var. *saccharum*, rich wooded ravines; frequent (00013).

## ANACARDIACEAE

*Rhus aromatica* Aiton, dry wooded bluff; rare (01241).

*Rhus copallinum* L. var. *latifolia* Engl., old field; common (00616).

†*Rhus glabra* L., woodland clearing; rare (00690).

†*Toxicodendron pubescens* Mill., dry woods; rare (00686).

†*Toxicodendron radicans* (L.) Kuntze, woods and old field; common (00737).

## ANNONACEAE

*Asimina triloba* (L.) Dunal, rich woods and streambanks; frequent (01363).

## APIACEAE

*Angelica venenosa* (Greenway) Fernald, old field; scarce (00634).

*Chaerophyllum procumbens* (L.) Crantz, rich wooded streambank; infrequent (05976).

*Cryptotaenia canadensis* (L.) DC., rich woods; frequent (01023).

\**Daucus carota* L., old field; frequent (00724).

*Ligusticum canadense* (L.) Britton, rich woods; rare (02465).

†*Osmorhiza claytonii* (Michx.) C.B.Clarke, rich woods; frequent (00728).

*Oxypolis rigidior* (L.) Raf., calcareous seeps; common (01115).

*Sanicula canadensis* L. var. *canadensis*, woods; common (00754).

†*Sanicula smallii* E.P.Bicknell, dry upland woods; scarce (00620).

†*Sanicula trifoliata* E.P.Bicknell, rich wooded slope; very rare (00272).

*Thaspium trifoliatum* (L.) A.Gray var. *aureum* Britton, rich woods and streambanks; common (00526).

†*Thaspium trifoliatum* (L.) A.Gray var. *trifoliatum*, rich woods; rare (02215 VDB).

\**Torilis arvensis* (Huds.) Link var. *arvensis*, disturbed site and old field; scarce (00709).

## APOCYNACEAE

†*Apocynum cannabinum* L., dry upland woods; very rare (02551).

## ARALIACEAE

†*Aralia racemosa* L., rich woods; very rare (00853).

†*Aralia spinosa* L., edge of old field and woods; rare (01543).

†*Panax quinquefolius* L., rich woods; scarce (00739).

## ARISTOLOCHIACEAE

†*Aristolochia serpentaria* L., rich woods; scarce (00736).

*Asarum canadense* L., rich woods; frequent (04291).

## ASCLEPIADACEAE

†*Asclepias exaltata* L., rich wooded streambank; very rare (02605).

*Asclepias quadrifolia* Jacq., rocky wooded bank; rare (02155).

*Asclepias tuberosa* L. ssp. *interior* Woodson, old field; scarce (00759).

*Asclepias variegata* L., old field; scarce (02230).

*Asclepias verticillata* L., dry rocky wooded bluffs; very rare (02675).

## ASTERACEAE

\**Achillea millefolium* L., old field; frequent (00871, 02228).

†*Ageratina altissima* (L.) R.M.King & H.Rob. var. *altissima*, old field and woods; occasional (01232).

*Ambrosia artemisiifolia* L., old field and disturbed site; occasional (01212).

- †*Ambrosia trifida* L. var. *trifida*, old field and disturbed site; scarce (01214).
- Antennaria plantaginifolia* (L.) Richardson, upland woods; frequent (01819).
- †*Antennaria solitaria* Rydb., upland woods; infrequent (01841).
- †*Arnoglossum atriplicifolium* (L.) H. Rob., rich woods; occasional (01231).
- †*Arnoglossum muehlenbergii* (Schultz-Bip) H. Rob., rich woods; rare (02587).
- †\**Baccharis halimifolia* L., disturbed site; very rare (not collected).
- †*Bidens aristosa* (Michx.) Britton, old field; infrequent (01215).
- Bidens frondosa* L., old field, disturbed site, and streambanks; occasional (01218).
- \**Carduus nutans* L., disturbed site; rare (00710).
- †*Chrysopsis mariana* (L.) Elliott, dry upland woods; scarce (01221).
- Cirsium discolor* (Muhl. ex Willd.) Spreng., old field; occasional (01096).
- †*Cirsium muticum* Michx., calcareous seeps and wet streambanks; infrequent (01236).
- Conoclinium coelestinum* (L.) DC., streambanks and old field; frequent (01230).
- Conyza canadensis* (L.) Cronquist var. *canadensis*, old field and disturbed site; occasional (01106).
- †*Coreopsis major* Walter, old field; frequent (00692).
- Coreopsis tripteris* L., old field; occasional (01079).
- Eclipta prostrata* (L.) L., disturbed site; very rare (01410).
- Elephantopus carolinianus* Raeusch., woods, roadsides, and trails; occasional (00880).
- †*Elephantopus tomentosus* L., dry upland woods; infrequent (02536).
- Erechtites hieraciifolia* (L.) Raf. ex DC., old field, disturbed site, and dry burned-over woods; frequent (01210).
- Erigeron annuus* (L.) Pers., old field; infrequent (00723).
- †*Erigeron philadelphicus* L. var. *philadelphicus*, disturbed site; infrequent (02014).
- †*Erigeron pulchellus* Michx. var. *pulchellus*, rocky wooded streambanks; infrequent (01840).
- Erigeron strigosus* Muhl. ex Willd. var. *strigosus*, old field; occasional (00644).
- †*Eupatorium capillifolium* (Lam.) Small, old field; infrequent (01402).
- †*Eupatorium fistulosum* Barratt, streambanks; infrequent (01116).
- †*Eupatorium hyssopifolium* L., old field; common (01175).
- †*Eupatorium perfoliatum* L., old field; very rare (02961).
- †*Eupatorium rotundifolium* L. var. *ovatum* (Bigelow) Torr., old field; common (00625).
- †*Eupatorium serotinum* Michx., disturbed site; rare (01297).
- Eupatorium sessilifolium* L., old field; occasional (00875).
- †*Eurybia hemispherica* (Alexander) Nesom, dry wooded slopes and old field; occasional (01293).
- †*Eurybia macrophylla* (L.) Cass., rich wooded streambank; very rare (01122 VDB).
- †*Gamochaeta purpurea* (L.) Cabrera, disturbed site; infrequent (01008).
- †*Helianthus divaricatus* L., dry bluffs; very rare (02579).
- Helianthus eggertii*** Small, old field and edge of oak-hickory forest; infrequent (00643).
- †*Helianthus hirsutus* Raf., old field and margins; frequent (00863).
- Helianthus microcephalus* Torr. & A. Gray, woods and margins; infrequent (01217).
- Heliopsis helianthoides* (L.) Sweet, rich woods and ravines; occasional (00903).
- Hieracium gronovii* L., dry woods; occasional (02680).
- †\**Hypochaeris radicata* L., grassy bank; very rare (01396).
- †*Ionactis linariifolius* (L.) Greene, dry wooded slopes; rare (01466).
- Krigia biflora* (Walter) Blake, upland woods; frequent (00541).
- †*Krigia caespitosa* (Raf.) Chambers, disturbed site; rare (04516).
- †*Krigia virginica* (L.) Willd., upland woods and disturbed site; rare (04508).
- †*Lactuca canadensis* L., old field; infrequent (00886).
- †*Lactuca floridana* (L.) Gaertn., woods and old field; infrequent (01125).
- †\**Lactuca serriola* L., disturbed site; rare (01084).
- \**Leucanthemum vulgare* Lam., old field and disturbed site; occasional (00721).
- Packera anomyma* (Wood) W.A. Weber & A. Löve, old field; common (00218).

- †*Packeria glabella* (Poir.) C. Jeffrey, streambanks, wet soil; rare (00440).
- Packeria obovata* (Muhl. ex Willd.) W.A. Weber & A. Löve, upland woods and rocky banks; scarce (not collected).
- Polymnia canadensis* L., rich wooded ravines among boulders and on bluffs; common (02468).
- †*Prenanthes altissima* L., rich woods and bluffs; occasional (01361).
- †*Pseudognaphalium obtusifolium* (L.) Hilliard & Burt., old field; frequent (01216).
- Pyrrhopappus carolinianus* (Walter) DC., old field; frequent (00867).
- Rudbeckia fulgida* Aiton var. *umbrosa* (Boynton & Beadle) Cronquist, calcareous seeps and streambanks; common (01123).
- †*Rudbeckia hirta* L. var. *pulcherima* Farw., old field; frequent (00574)
- Rudbeckia triloba* L. var. *triloba*, old field; rare (01108).
- †*Sericocarpus linifolius* (L.) B.S.P., old field; rare (02545).
- Silphium asteriscus* L. var. *asteriscus*, slope in woods; infrequent (00682).
- Silphium mohrii* Small, old field and disturbed site; rare (01081).
- †*Smallanthus uvedalius* (L.) Mack. ex Small, rich woods; infrequent (01281).
- †*Solidago altissima* L., old field; frequent (01404).
- Solidago arguta* Aiton var. *caroliniana* A. Gray, old field and dry woods; occasional (01061).
- Solidago caesia* L., rich woods and bluffs; frequent (01167).
- †*Solidago curtisii* Torr. & A. Gray, rich woods; infrequent (01362 VDB).
- †*Solidago erecta* Pursh, dry upland woods; frequent (01511).
- †*Solidago gigantea* Aiton, streambanks, mesic clearings, and old field; infrequent (01104).
- Solidago hispida* Muhl. ex Willd., dry upland woods and rocky banks; infrequent (01058).
- Solidago juncea* Aiton, old field; common (01102).
- †*Solidago missouriensis* Nutt. var. *fasciculata* Holz., old field; infrequent (00866).
- †*Solidago nemoralis* Aiton, old field; common (01401).
- †*Solidago odora* Aiton, old field; occasional (01219).
- Solidago patula* Muhl. ex Willd., calcareous seeps and streambanks; frequent (01364).
- †*Solidago rugosa* Mill. ssp. *aspera* (Aiton) Cronquist, woods and streambanks; occasional (01062).
- Solidago ulmifolia* Muhl. ex Willd., upland woods; common (01090).
- \**Sonchus asper* (L.) Hill, disturbed site; rare (02240).
- Symphytotrichum cordifolium* (L.) Nesom, rich woods; infrequent (01490).
- †*Symphytotrichum dumosum* (L.) Nesom, old field and dry woods; frequent (01376).
- Symphytotrichum lateriflorum* (L.) A. & D. Löve, woods and streambanks; frequent (01372).
- †*Symphytotrichum oolentangiense* (Riddell) Nesom, dry woods; very rare (number unavailable VDB).
- Symphytotrichum patens* (Aiton) Nesom, old field; frequent (01398).
- Symphytotrichum pilosum* (Willd.) Nesom var. *pilosum*, old field and disturbed site; occasional (01380).
- Symphytotrichum shortii* (Lindl.) Nesom, woods; frequent (01369).
- †*Symphytotrichum undulatum* (L.) Nesom, dry field; infrequent (02967 VDB).
- †*Symphytotrichum urophyllum* (Lindl.) Nesom, rich woods and rocky banks; frequent (00638).
- †\**Taraxacum officinale* G.H. Weber ex Wiggers, disturbed site; scarce (02219).
- Verbesina alternifolia* (L.) Britton ex Kearney, rich wooded streambank; very rare (01168).
- Verbesina virginica* L., old field; rare (01242).
- Vernonia gigantea* (Walter) Trel., old field; occasional (01044).

#### BALSAMINACEAE

- †*Impatiens capensis* Meerb., calcareous seeps and streambanks; common (01114).

#### BERBERIDACEAE

- Podophyllum peltatum* L., rich wooded stream terrace; scarce (00400).

#### BETULACEAE

- Alnus serrulata* (Aiton) Willd., streambanks and seeps; occasional (not collected).
- Carpinus caroliniana* Walter ssp. *virginiana* (Marsh.) Furlow, rich wooded ravines and streambanks; occasional (00481).

*Corylus americana* Walter, woods and streambanks; common (00489).

*Ostrya virginiana* (Mill.) K.Koch, rocky upland woods; occasional (01368).

#### BIGNONIACEAE

*Bignonia capreolata* L., woods; occasional (00005).

*Campsis radicans* (L.) Seem. ex Bureau, disturbed site; very rare (01551).

\**Catalpa* cf. *speciosa* (Warder) Warder ex Engelm., disturbed site; very rare (05974).

#### BORAGINACEAE

†*Cynoglossum virginianum* L., upland woods; frequent (01270).

*Myosotis macrosperma* Engelm., woods; occasional (01887).

#### BRASSICACEAE

*Arabis laevigata* (Muhl. ex Willd.) Poir. var. *laevigata*, rich rocky woods, boulders, and bluffs; frequent (00814).

†*Barbarea vulgaris* Ait.f., disturbed site; rare (01977).

†*Cardamine angustata* O.E.Schulz., woods; frequent (00451).

*Cardamine bulbosa* (Schreb. ex Muhl.) B.S.P., seeps and streambanks; infrequent (01883).

*Cardamine concatenata* (Michx.) Sw., rich woods; infrequent (00327).

\**Cardamine hirsuta* L., woods, bluffs, and disturbed site; frequent (00301).

†*Cardamine parviflora* L., dry rocks; rare (01010).

*Cardamine pennsylvanica* Muhl. ex Willd., calcareous seeps; scarce (01999).

\**Rorippa nasturtium-aquaticum* (L.) Hayek, streams; infrequent (00522).

#### BUXACEAE

*Pachysandra procumbens* Michx., rich wooded ravines and streambanks; common (not collected).

#### CALLITRICHACEAE

*Callitriche heterophylla* Pursh. ssp. *heterophylla*, swift, shallow stream; very rare (00480).

†*Callitriche terrestris* Raf., disturbed site; very rare (04511).

#### CAMPANULACEAE

†*Lobelia cardinalis* L., streambanks and seeps; infrequent (01112).

†*Lobelia inflata* L., upland woods and disturbed site; occasional (00902).

*Lobelia puberula* Michx., old field; frequent (01087).

*Lobelia siphilitica* L., streambanks and seeps; occasional (01165).

#### CAPRIFOLIACEAE

\**Lonicera japonica* Thunb., old field and woods; common in old field, occasional elsewhere (00046).

*Lonicera sempervirens* L., dry, rocky wooded slopes; rare (00090).

†*Sambucus nigra* L. ssp. *canadensis* (L.) R.Bolli, moist openings and streambanks; infrequent (01580).

*Symphoricarpos orbiculatus* Moench, dry upland woods and edge of old field; infrequent (00978).

*Triosteum angustifolium* L., dry upland thicket; very rare (00889).

*Viburnum rufidulum* Raf., dry rocky wooded banks; infrequent (00676).

#### CARYOPHYLLACEAE

\**Cerastium brachypetalum* Desp. ex Pers. ssp. *brachypetalum*, disturbed site; rare (02227 VDB).

†*Cerastium brachypodum* (Engelm. ex A. Gray) B.L.Rob., dry rock outcrops; rare (00815).

\**Cerastium glomeratum* Thuill., disturbed site; rare (04510).

*Cerastium nutans* Raf., rocky woods; infrequent (00387).

†\**Cerastium pumilum* W.Curtis, disturbed site; rare (01821 VDB).

†*Silene stellata* (L.) Ait.f., upland wooded ravines and streambanks; scarce (00843).

*Silene virginica* L., wooded banks and rocky slopes; frequent (01028).

\**Stellaria media* (L.) Vill., disturbed site, gravel bars in streams, and moist creek banks; occasional (00396).

†*Stellaria pubera* Michx., rich ravines and streambanks; frequent (00071).

#### CELASTRACEAE

†*Euonymus americana* L., woods and streambanks; frequent (00525).

*Euonymus atropurpurea* Jacq., rich wooded stream terrace; very rare (not collected).

**CHENOPODIACEAE**

\**Chenopodium album* L., disturbed site; rare (01379).

**CISTACEAE**

†*Lechea mucronata* Raf., old field; rare (01405).

†*Lechea tenuifolia* Michx., dry wooded slope; rare (01069).

**CLUSIACEAE**

†*Hypericum drummondii* (Grev. & Hook.) Torr. & A. Gray, old field; scarce (01579).

*Hypericum frondosum* Michx., dry bluffs; rare (02471).

†*Hypericum hypericoides* (L.) Crantz, ssp. *hypericoides*, dry upland woods; occasional (00857).

†*Hypericum hypericoides* (L.) Crantz ssp. *multicaule* (Michx. ex Willd.) Robson, dry upland oak-hickory forest; common (01512).

†*Hypericum mutilum* L., disturbed site; very rare (03495).

*Hypericum punctatum* Lam., old field and along edge of woods; frequent (00888).

**CONVOLVULACEAE**

†*Calystegia catesbeiana* Pursh, dry upland thicket; very rare (02154).

*Ipomoea pandurata* (L.) G.Mey., dry woods; scarce (00905).

**CORNACEAE**

*Cornus alternifolia* L.f., rich woods and streambanks; frequent (00075).

*Cornus amomum* Mill., streambanks and seeps; rare (00738).

*Cornus drummondii* C.A.Mey., upland woods; very rare (01170).

†*Cornus florida* L., woods; common (00105).

*Nyssa sylvatica* Marsh., upland woods; common (00544).

**CRASSULACEAE**

†*Sedum ternatum* Michx., Moist rocks by stream; very rare (01493).

**CUCURBITACEAE**

*Sicyos angulatus* L., Moist opening along streambank; very rare (02459).

**CUSCUTACEAE**

†*Cuscuta compacta* Juss. ex Choisy, streambanks and calcareous seeps; infrequent (01223).

†*Cuscuta gronovii* Willd. ex Schult. Calcareous seep; very rare (01235).

*Cuscuta pentagona* Engelm., at edge of woods and old field; very rare (01107).

**EBENACEAE**

*Diospyros virginiana* L., upland woods and thickets; very rare (00548).

**ELAEAGNACEAE**

†\**Elaeagnus umbellata* Thunb., upland woods; very rare (00839).

**ERICACEAE**

†*Kalmia latifolia* L., dry upland slopes and rocky banks; frequent (00530).

*Oxydendrum arboreum* (L.) DC., dry woods and slopes; common (01489).

*Rhododendron alabamense* Rehder, dry to moist wooded banks and terraces; frequent (01164).

*Rhododendron canescens* (Michx.) Sweet, dry woods and banks; occasional (00684).

*Rhododendron periclymenoides* (Michx.) Shinners, upland woods; rare (01498).

†*Vaccinium arboreum* Marsh., dry woods and slopes; frequent (00488).

†*Vaccinium corymbosum* L., wooded bank; very rare (00508).

*Vaccinium pallidum* Aiton, dry woods; common (00540).

*Vaccinium stamineum* L., dry woods and rocky banks; occasional (00617).

**EUPHORBIACEAE**

†*Acalypha gracilens* A. Gray, dry woods and roadsides; scarce (02717).

*Acalypha ostryifolia* Riddell, disturbed site; very rare (01503).

*Acalypha thomboidea* Raf., upland woods, rich woods, and streambanks; occasional (00859).

*Chamaesyce nutans* (Lag.) Small, old field and disturbed site; infrequent (01412).

†*Chamaesyce prostrata* (Aiton) Small, disturbed site; rare (01575).

*Croton capitatus* Michx., disturbed site; rare (01243).

*Croton monanthogynus* Michx., dry upland disturbed site; rare (01099).

*Euphorbia corollata* L., old field; frequent (00711).

**FABACEAE**

†\**Albizia julibrissin* Durazz., upland woods; rare (01488).

*Amphicarpaea bracteata* (L.) Fernald, rich woods and streambanks; frequent (01154).



- Apios americana* Medik. Calcareous seep; rare (not collected).
- † *Apios priceana* B.L. Rob., rich streambank and rocky hillside; very rare (02679).
- Cercis canadensis* L., woods; occasional (00674).
- † *Chamaecrista fasciculata* (Michx.) Greene, old field and disturbed site; occasional (00862).
- † *Chamaecrista nictitans* (L.) Moench, old field; rare (04267).
- Clitoria mariana* L., old field; infrequent (00868).
- † *Desmodium ciliare* (Muhl. ex Willd.) DC., old field; occasional (01097).
- Desmodium glabellum* (Michx.) DC., upland woods; infrequent (02945 VDB).
- † *Desmodium glutinosum* (Muhl. ex Willd.) Wood, rich woods and streambanks; infrequent (00677).
- Desmodium nudiflorum* (L.) DC., upland woods; frequent (00852).
- Desmodium paniculatum* (L.) DC., upland woods, rich wooded streambank, old field, and disturbed site; infrequent (01394).
- † *Desmodium pauciflorum* (Nutt.) DC., rich woods and streambanks; occasional (00846).
- † *Desmodium perplexum* Schub., old field; frequent (01101).
- † *Desmodium rotundifolium* DC., dry upland woods; infrequent (01109).
- † *Desmodium viridiflorum* (L.) DC., old field; infrequent (01284 VDB).
- Galactia volubilis* (L.) Britton, old field; frequent (00865).
- † \* *Kummerowia stipulacea* (Maxim.) Makino, disturbed site; rare (01213).
- † \* *Kummerowia striata* (Thunb.) Schindl., old field and disturbed site; infrequent (01103).
- † \* *Lathyrus hirsutus* L., disturbed site; rare (02167).
- † \* *Lespedeza bicolor* Turcz., old field; frequent (00873).
- † \* *Lespedeza cuneata* (Dum.-Cours.) G. Don, old field; frequent (01098).
- Lespedeza frutescens* (L.) Hornem., old field; occasional (01095).
- † *Lespedeza hirta* (L.) Hornem., dry woods and edge of old field; infrequent (01171).
- † *Lespedeza procumbens* Michx., old field and dry woods; frequent (01100).
- † *Lespedeza repens* (L.) W. Bartram, old field and dry woods; infrequent (00752).
- † *Lespedeza stuevei* Nutt., old field; rare (01285 VDB).
- † *Lespedeza violacea* (L.) Pers., old field; scarce (01161).
- † *Lespedeza virginica* (L.) Britton, old field; occasional (01383).
- \* *Medicago lupulina* L., disturbed site; infrequent (00713).
- † \* *Medicago sativa* L., disturbed site; very rare (03509).
- \* *Melilotus alba* Medik., disturbed site and old field; infrequent (00703).
- † *Mimosa microphylla* Dry., old field; rare (02538).
- † *Orbexilum pedunculatum* (Mill.) Rydb., old field and dry woods; scarce (00977).
- Robinia pseudoacacia* L., upland woods and edges of old field; infrequent (01573).
- Senna marilandica* (L.) Link, disturbed site and streambanks; scarce (01211).
- † *Tephrosia virginiana* (L.) Pers., old field and dry woods; infrequent (00630).
- \* *Trifolium campestre* Schreb., old field and disturbed site; scarce (01979).
- \* *Trifolium pratense* L., old field and disturbed site; scarce (01075).
- † \* *Trifolium repens* L., disturbed site; scarce (02168).
- † *Vicia caroliniana* Walter, rich ravines; occasional (00125).
- \* *Vicia sativa* L. ssp. *nigra* Ehrh., disturbed site; scarce (02018).
- \* *Vicia villosa* Roth ssp. *varia* (Host) Corb., disturbed site; scarce (02237).

## FAGACEAE

- † *Castanea dentata* (Marsh.) Borkh., dry upland woods; rare (00491).
- Fagus grandifolia* Ehrh., rich ravines; occasional (01016).
- Quercus alba* L., woods; common (00628).
- Quercus coccinea* Muenchh., dry upland woods; occasional (00635).
- † *Quercus falcata* Michx., upland woods; occasional (01510).
- † *Quercus marilandica* Muenchh., dry ridges; infrequent (01163).
- Quercus muehlenbergii* Engelm., rich rocky wooded slopes and ravines; occasional (00731).
- † *Quercus phellos* L., old field; rare (00631).
- Quercus prinus* L., dry upland slopes and ridges; common (01014).

†*Quercus rubra* L., rich woods and ravines; scarce (00740).

*Quercus* *sauilii* Schneid. (*alba* × *prinus*), upland woods; very rare (not collected).

*Quercus stellata* Wangenh., upland woods; frequent (00545).

*Quercus velutina* Lam., upland woods; frequent (01015).

#### FUMARIACEAE

*Corydalis flavula* (Raf.) DC., rich wooded stream terrace; rare (00335).

#### GENTIANACEAE

*Frasera carolinensis* Walter, rich woods and stream terraces; infrequent (03732).

†*Gentiana villosa* L., dry upland woods; very rare (06054).

†*Obolaria virginica* L., upland woods and ravines; rare (03177).

*Sabatia angularis* (L.) Pursh, old field and disturbed site; rare (02682).

#### GERANIACEAE

*Geranium carolinianum* L. var. *carolinianum*, disturbed site; scarce (02217).

†*Geranium maculatum* L., rich woods and banks; occasional (00078).

#### HAMAMELIDACEAE

†*Hamamelis virginiana* L., woods and ravines; frequent (00513).

†*Liquidambar styraciflua* L., upland woods; infrequent (00841).

#### HYDRANGEACEAE

†*Hydrangea cinerea* Ser., rich bluffs and streambanks; common (00573).

*Philadelphus hirsutus* Nutt., rocky woods and bluffs; rare (00517).

#### HYDROPHYLLACEAE

*Nemophila aphylla* (L.) Brummitt, rich wooded streambank terrace; scarce (00344).

*Phacelia bipinnatifida* Michx., rich woods often among rocks and boulders; infrequent (01890).

#### JUGLANDACEAE

†*Carya alba* (L.) Nutt. ex Elliott, upland woods; common (00627).

*Carya cordiformis* (Wangenh.) K.Koch, rich woods and ravines; scarce (00900).

*Carya glabra* (Mill.) Sweet, upland woods; occasional (not collected).

*Carya ovalis* (Wangenh.) Sarg., upland woods; infrequent (00725).

†*Carya ovata* (Mill.) K.Koch, rich rocky slopes and ravines; infrequent (02674).

***Juglans cinerea*** L., rich ravines; scarce (00898).

*Juglans nigra* L., rich ravines, rare (01540).

#### LAMIACEAE

†*Blephilia ciliata* (L.) Benth., rich woods and streambanks; infrequent (00911).

†*Collinsonia canadensis* L., rich woods and ravines; occasional (01353).

†*Cunila organoides* (L.) Britton, dry upland woods and slopes; occasional (01209).

\**Glechoma hederacea* L., disturbed site; scarce (00450).

†*Lycopus rubellus* Moench. In streams, wet banks, and calcareous seeps; frequent (01111).

*Monarda bradburiana* Beck, upland woods and rocky slopes; occasional (00523).

*Monarda fistulosa* L., old field and disturbed site; infrequent (00701).

†\**Perilla frutescens* (L.) Britton, disturbed site; rare (01556).

\**Prunella vulgaris* L., disturbed site and streambanks; occasional (00543).

*Pycnanthemum loomisii* Nutt., old field; common (00872).

†*Pycnanthemum tenuifolium* Schrad., old field; frequent (00632).

*Salvia lyrata* L., old field and woods; occasional (00609).

*Salvia urticifolia* L., upland woods; rare (04509).

†*Scutellaria elliptica* Muhl. ex Spreng. var. *hirsuta* (Short & Peter) Fernald, woods and streambanks; occasional (00572).

*Teucrium canadense* L., rich streambank; very rare (03503).

#### LAURACEAE

†*Lindera benzoin* (L.) Blume, rich woods; frequent (00487).

*Sassafras albidum* (Nutt.) Nees, upland woods and edges of old field, infrequent (00689).

#### LOGANIACEAE

*Spigelia marilandica* (L.) L., streambank; very rare (00890).

#### MAGNOLIACEAE

*Liriodendron tulipifera* L., rich woods; occasional (00840).

**MALVACEAE**

*Sida spinosa* L., disturbed site; rare (01576).

**MENISPERMIACEAE**

†*Menispermum canadense* L., rich wooded ravine; rare (02611).

**MONOTROPACEAE**

†*Monotropa uniflora* L., upland oak-hickory woods; very rare (02942).

**MORACEAE**

*Morus rubra* L., rich wooded ravines; scarce (00696).

**OLEACEAE**

*Chionanthus virginicus* L., rich streambanks; rare (00741).

*Fraxinus americana* L., woods and ravines; frequent (00730).

*Fraxinus pennsylvanica* Marsh., moist upland depression; very rare (00718).

\**Ligustrum sinense* Lour., streambanks; scarce (00045).

**ONAGRACEAE**

†*Circaea lutetiana* L. ssp. *canadensis* (L.) Asch. & Magnus, rich woods and streambanks; occasional (00894).

†*Oenothera biennis* L., old field and disturbed site; scarce (01577).

†*Oenothera laciniata* Hill, disturbed site; very rare (02239).

**ORBANCHACEAE**

†*Conopholis americana* (L.) Wallr.f., woods beneath oak trees; occasional (00606).

**OXALIDACEAE**

†*Oxalis dillenii* Jacq., dry field; infrequent (01828).

*Oxalis stricta* L., dry rocky woods and disturbed site; occasional (00510).

*Oxalis violacea* L., dry rock outcrops; infrequent (00397).

**PAPAVERACEAE**

*Sanguinaria canadensis* L., rich woods; scarce (00449).

**PASSIFLORACEAE**

*Passiflora incarnata* L., old field and disturbed site; infrequent (00623).

*Passiflora lutea* L., rich woods and streambanks; infrequent (00732).

**PHYTOLACCACEAE**

*Phytolacca americana* L., disturbed soil; scarce (00858).

**PLANTAGINACEAE**

†\**Plantago lanceolata* L., disturbed site; occasional (00720).

†*Plantago rugelii* Dcne., disturbed site; occasional (00712).

**PLATANACEAE**

*Platanus occidentalis* L., streambanks; infrequent (00253).

**POLEMONIACEAE**

*Phlox amoena* Sims, rocky woods; rare (00529).

*Phlox amplifolia* Britton, old field; very rare (00626 VDB).

*Phlox divaricata* L., rich woods and rocky banks; common (not collected).

*Phlox glaberrima* L., Calcareous seeps; very rare (01494).

†*Phlox pilosa* L. ssp. *ozarkana* (Wherry) Wherry, old field; very rare (02233).

*Polemonium reptans* L., rich woods and streambanks; common (00117).

**POLYGONACEAE**

†\**Polygonum caespitosum* Blume var. *longisetum* (Bruyn) Steward, disturbed site and gravel bars of streams; occasional (01152).

*Polygonum pensylvanicum* L., disturbed site; rare (01411).

†\**Polygonum persicaria* L., disturbed site; scarce (00844).

†*Polygonum punctatum* Elliott, disturbed site; scarce (00640).

*Polygonum scandens* L., Edge of old field and woods; rare (01229).

†*Polygonum setaceum* Baldw., wet streambanks; infrequent (01153).

*Polygonum virginianum* L., rich woods and streambanks; occasional (01110).

†\**Rumex acetosella* L., old field; scarce (00622).

†\**Rumex crispus* L., disturbed site; rare (00546).

†\**Rumex obtusifolius* L., wet streambank; very rare (00897).

**PORTULACACEAE**

*Claytonia virginica* L., rich woods; common (00077).

**PRIMULACEAE**

- †*Lysimachia ciliata* L., wet streambanks; infrequent (01060).  
*Lysimachia* cf. *hybrida* Michx., upland woods; frequent (00756).  
*Lysimachia quadrifolia* L., upland woods and old field; rare (02165).  
 †*Samolus valerandi* L. ssp. *parviflorus* (Raf.) Hultén, wet streambank; very rare (00849).

**PYROLACEAE**

- †*Chimaphila maculata* (L.) Pursh, upland woods; common (00027).

**RANUNCULACEAE**

- Actaea pachypoda* Elliott, rich woods; infrequent (01024).  
 †*Anemone quinquefolia* L., rich woods and streambanks; scarce (00076).  
*Anemone virginiana* L., old field and upland woods; scarce (01070).  
*Aquilegia canadensis* L., rich bluffs and slopes; occasional (00979).  
*Clematis versicolor* Small ex Rydb., rich woods; very rare (01025).  
 †*Clematis virginiana* L., rich wooded ravines; rare (01357).  
 †*Hepatica nobilis* Schreb. var. *acuta* (Pursh) Steyermark, rich woods and slopes; common (00446).  
 †*Hydrastis canadensis* L., rich wooded ravines; scarce (01354).  
 †\**Ranunculus bulbosus* L., old field; very rare (00415 VDB).  
*Ranunculus hispidus* Michx. var. *hispidus*, rocky woods and banks; occasional (00068).  
*Ranunculus micranthus* Nutt., limestone bluffs; rare (01822).  
 †*Ranunculus recurvatus* Poir., streambanks; frequent (00519).  
 \**Ranunculus sardous* Crantz, disturbed site and old field; infrequent (01584).  
*Thalictrum revolutum* DC., rich wooded streambanks; infrequent (00878).  
*Thalictrum thalictroides* (L.) Eames & Boivin, rich woods; frequent (00127).

**RHAMNACEAE**

- Ceanothus americanus* L., old field and edge of dry woods; infrequent (00566).  
*Frangula caroliniana* (Walter) A. Gray, woods and edges of old field; scarce (01486).

**ROSACEAE**

- †*Agrimonia parviflora* Aiton, wet streambank; rare (01057).  
*Agrimonia rostellata* Wallr., woods and streambanks; frequent (00850).  
 †*Amelanchier arborea* (Michx.f.) Fernald, upland woods; frequent (00357).  
*Crataegus calpodendron* (Ehrh.) Medik., rocky woods and slopes; infrequent (00518).  
*Crataegus* cf. *flabellata* (Spach) Kirchn., old field; very rare (01030 VDB).  
 †*Crataegus pruinosa* (Wendl.f.) K.Koch, dry rocky slope forest; rare (02602 VDB).  
 †\**Duchesnea indica* (Andr.) Focke, disturbed sites and gravel bars of streams; rare (05975).  
*Geum canadense* Jacq., woods and bluffs; occasional (00094).  
 †*Malus angustifolia* (Aiton) Michx. var. *angustifolia*, dry rocky wooded slope; very rare (02957).  
 †*Porteranthus stipulatus* (Muhl. ex Willd.) Britton, dry woods; infrequent (00726).  
*Potentilla simplex* Michx., dry woods and old field; frequent (00514).  
*Prunus mexicana* S. Watson, dry woods and rocky slopes; rare (00528).  
*Prunus serotina* Ehrh., upland woods and edges of old field; scarce (00058).  
*Rosa carolina* L., edge of woods and old field; scarce (00570).  
 †\**Rosa multiflora* Thunb. ex Murr., moist streambanks; infrequent (00520).  
*Rosa setigera* Michx., limestone outcrops in woods; very rare (01124).  
 †*Rubus allegheniensis* Porter, upland woods; infrequent (00883).  
 †\**Rubus bifrons* Vest ex Tratt., old field; common (00621).  
 †*Rubus invisus* (L.H.Bailey) Britton, upland woods; infrequent (02021).  
*Rubus occidentalis* L., woods; infrequent (00042).  
 †*Rubus pensilvanicus* Poir., upland woods and disturbed site; infrequent (00637).  
 †*Waldsteinia fragarioides* (Michx.) Tratt., rich woods; rare (00073).

**RUBIACEAE**

- Cephalanthus occidentalis* L., streambank; very rare (00845).  
*Diodia teres* Walter, old field; frequent (00882).

†*Galium aparine* L., rich woods; occasional (00509).

*Galium circaeans* Michx., rich woods; occasional (00483).

*Galium pilosum* Aiton, old field; occasional (00624).

*Galium triflorum* Michx., rich woods and moist bluffs; frequent (00641).

†*Houstonia caerulea* L., upland woods; frequent (00386).

*Houstonia purpurea* L. var. *purpurea*, woods and banks; frequent (00536).

†*Houstonia pusilla* Schoepf, grassy roadbed; very rare (00813).

*Mitchella repens* L., moist woods; infrequent (00303).

### SALICACEAE

†*Populus deltoides* Bartram ex Marsh., gravel bar in stream; very rare (01233).

†*Salix caroliniana* Michx., calcareous seep; very rare (01496).

*Salix humilis* Marsh. var. *humilis*, old field and thickets; infrequent (00060).

†*Salix nigra* Marsh., wet streambank; rare (01156).

### SAPOTACEAE

*Sideroxylon lycioides* L., rocky banks; rare (00910).

### SAXIFRAGACEAE

†*Heuchera americana* L. var. *americana*, rich woods; scarce (00533).

*Heuchera villosa* Michx. var. *macrorhiza* (Small) Rosend., Butters, & Lakela, limestone bluffs and boulders; frequent (00511).

***Parnassia grandifolia*** DC., calcareous seep; rare (01495).

*Saxifraga virginiana* Michx., limestone bluffs and boulders; frequent (00081).

†*Tiarella cordifolia* L., rich woods and banks; frequent (00070).

### SCROPHULARIACEAE

†*Agalinis gattingeri* (Small) Small, dry rocky woods; rare (01375).

*Aureolaria flava* (L.) Farw., dry woods; rare (not collected).

†*Aureolaria pectinata* (Nutt.) Pennell, dry woods; rare (00899).

†*Chelone glabra* L., wet streambanks and calcareous seeps; infrequent (01360).

*Mimulus alatus* Aiton, wet streambanks; infrequent (01067).

†\**Paulownia tomentosa* (Thunb.) Sieb. & Zucc. ex Steud., disturbed site; rare (01515).

*Pedicularis canadensis* L., rich streambanks; infrequent (00080).

†*Scrophularia marilandica* L., streambanks; rare (01467).

\**Verbascum blattaria* L., disturbed site; rare (01344).

†\**Verbascum thapsus* L., disturbed site; scarce (00876).

\**Veronica arvensis* L., disturbed site; infrequent (02019).

†\**Veronica serpyllifolia* L., rich mossy streambanks; rare (00562).

*Veronicastrum virginicum* (L.) Farw., old field and disturbed site; very rare (00887).

### SIMAROUBACEAE

\**Ailanthus altissima* (Mill.) Swingle, clearing in woods; very rare (00879).

### SOLANACEAE

†\**Datura stramonium* L., disturbed site; very rare (01409).

*Physalis heterophylla* Nees, old field and upland thicket; scarce (01574).

†*Physalis longifolia* Nutt. var. *subglabrata* (Mack. & Bush) Cronquist, old field; infrequent (00708).

†*Physalis pubescens* L. var. *integrifolia* (Dunal) Waterf., gravel bar in stream; scarce (04292).

*Solanum carolinense* L., old field and disturbed site; infrequent (00707).

*Solanum ptychanthum* Dunal, moist woods; scarce (01027).

### STAPHYLEACEAE

*Staphylea trifolia* L., rich wooded ravines and streambanks; occasional (01359).

### STYRACACEAE

*Styrax grandifolius* Aiton, upland woods and ravines; occasional (00479).

### THYMELAEACEAE

*Dirca palustris* L., rich wooded stream bank; rare (00639).

### TILIACEAE

*Tilia americana* L. var. *heterophylla* (Vent.) Loud., rich wooded streambank; very rare (01506).

### ULMACEAE

*Celtis laevigata* Willd., disturbed site; rare (00716).

*Celtis occidentalis* L., rich wooded ravines and stream terraces; rare (01019).

*Celtis tenuifolia* Nutt., dry wooded, rocky slope; very rare (01149 VDB).

*Ulmus alata* Michx., upland woods; infrequent (00349).

*Ulmus americana* L., rich stream bank; rare (00082).

*Ulmus rubra* Muhl., rich woods; occasional (00389).

*Ulmus serotina* Sarg., limestone bluffs and rocky slopes; rare (01017).

#### URTICACEAE

*Boehmeria cylindrica* (L.) Sw., wet streambanks and seeps; occasional (00848).

*Laportea canadensis* (L.) Wedd., rich woods; infrequent (01022).

*Parietaria pensylvanica* Muhl. ex Willd., Bluffs and rock outcrops; infrequent (01880).

†*Pilea pumila* (L.) A. Gray, streambanks and seeps; frequent (01225).

#### VALERIANACEAE

†*Valeriana pauciflora* Michx., rich wooded stream terrace, rare (01878).

*Valerianella radiata* (L.) Duf., disturbed site; scarce (01992).

#### VERBENACEAE

†*Phryma leptostachya* L., rich woods; occasional (00847).

*Verbena simplex* Lehm., old field, scarce (00688).

†*Verbena urticifolia* L., disturbed soil and gravel bars of streams; infrequent (00693).

#### VIOLACEAE

*Hybanthus concolor* (T.F. Forst.) Spreng., rich woods; rare (01885).

*Viola bicolor* Pursh, disturbed site; rare (04507).

†*Viola cucullata* Aiton, wet streambanks and seeps; occasional (01832).

†*Viola hirsutula* Brainerd, dry upland woods; occasional (02541).

*Viola sororia* Willd., rich woods; infrequent (01826).

*Vilola striata* Aiton, rich streambanks and terraces; infrequent (01884).

*Viola triloba* Schwein., rich woods; infrequent (01843).

*Viola tripartita* Elliott var. *glaberrima* (DC.) R.M. Harper, upland woods and ravines; occasional (01877).

#### VITACEAE

*Parthenocissus quinquefolia* (L.) Planch., moist woods and bluffs; occasional (00507).

†*Vitis aestivalis* Michx., dry upland woods; occasional (00490).

†*Vitis cinerea* (Engelm.) Millard var. *baileyana* (Munson) Comeaux, rich woods; infrequent (00485).

†*Vitis rotundifolia* Michx., upland woods; common (01076).

*Vitis vulpina* L., moist upland thicket; rare (02540).

#### MAGNOLIOPHYTA, LILIOPSIDA

#### ARACEAE

*Arisaema triphyllum* (L.) Schott ssp. *triphyllum*, woods; frequent (00568).

#### COMMELINACEAE

\**Commelina communis* L., streambanks and moist trails; infrequent (00901).

*Commelina virginica* L., streambanks; infrequent (01063).

*Tradescantia subaspera* Ker Gawl. var. *subaspera*, rich wooded ravine; rare (02588).

#### CYPERACEAE

†*Carex amphibola* Steud., rich wooded ravines; occasional (05979).

†*Carex cumberlandensis* Naczi, Kral, & Bryson, rich wooded ravines; frequent (02608).

*Carex albicans* Willd. ex Spreng var. *albicans*, woods; common (01846).

†*Carex albusina* E. Sheld., rich wooded ravines; occasional (02590).

†*Carex blanda* Dewey, wooded ravines and streambanks; frequent (s.n.).

*Carex cephalophora* Willd. ex Willd., woods; occasional (00755).

*Carex digitalis* Willd. var. *macropoda* Fernald, upland woods and dry ravines; occasional (05983).

*Carex frankii* Kunth, wet depression along road; rare (01689).

*Carex granularis* Muhl. ex Willd., Calcareous seep; very rare (02604).

†*Carex hirsutella* Mack., old field; frequent (01042).

†*Carex kraliana* Naczi & Bryson, rich wooded ravines, infrequent (05982).

†*Carex laevivaginata* (Kük.) Mack., streambank and gravel bar; rare (05981).

†*Carex laxiculmis* Schwein. var. *laxiculmis*, upland woods; rare (05980).

†*Carex lurida* Wahlenb., streambanks; infrequent (00442).

†*Carex pennsylvanica* Lam., upland woods; rare (01834).

†*Carex picta* Steud., upland woods and dry ravines; common (00443).

†*Carex radiata* (Wahlenb.) Small, rich alluvial terraces and adjacent slopes; scarce (06056).

*Carex rosea* Schkuhr ex Willd., rich wooded ravines; infrequent (03500).

†*Carex torta* Boott ex Tuckerman, streambanks; scarce (01833).

*Cyperus echinatus* (L.) A.W.Wood, old field; occasional (01041).

*Cyperus odoratus* L., old field and waste places; scarce (01578).

*Eleocharis obtusa* (Willd.) Schult., moist streambank; very rare (03727).

†*Scirpus atrovirens* Willd., streambanks; rare (02460).

†*Scirpus polyphyllus* Vahl, streambanks; infrequent (01054).

*Scleria oligantha* Michx., upland woods; scarce (06053).

#### DIOSCOREACEAE

†*Dioscorea quaternata* J.F.Gmel., rich woods; frequent (00484).

#### IRIDACEAE

†*Iris cristata* Aiton, woods and streambanks; frequent (01829).

*Sisyrinchium albidum* Raf., dry limestone bluff; rare (01817).

*Sisyrinchium angustifolium* Mill., wooded ravine and streambanks; infrequent (00531).

#### JUNCACEAE

†*Juncus coriaceus* Mack., calcareous seeps and streambanks; frequent (00683).

*Juncus tenuis* Willd., old field, roads and paths; occasional (00714).

†*Luzula acuminata* Raf. var. *carolinae* (S. Watson) Fernald, upland woods; occasional (01985).

*Luzula echinata* (Small) F.J.Herm., upland woods; common (01830).

#### LILIACEAE

*Allium canadense* L. var. *canadense*, old field; occasional (00535).

†*Allium canadense* L. var. *mobilense* (Regel) Ownbey, old field; rare (02456).

†*Chamaelirium luteum* (L.) A. Gray, rich wooded ravine; rare (00673).

†*Hymenocallis caroliniana* (L.) Herbert, wooded ravines, stream terraces and streambanks; infrequent (00753).

†*Lilium michiganense* Farw., wet streambank and wooded alluvial terrace; rare (00636).

*Maianthemum racemosum* (L.) Link. ssp. *racemosum*, rich woods; frequent (00681).

\**Narcissus pseudonarcissus* L., Old field; rare (not collected).

*Polygonatum biflorum* (Walter) Elliott, wooded ravines and streambanks; frequent (02004).

*Prosartes lanuginosa* (Michx.) D. Don, rich woods; rare (02591).

*Trillium stamineum* Harbison, rich woods; infrequent (00390).

†*Uvularia grandiflora* Sm., rich woods; occasional (01026).

†*Uvularia sessilifolia* L., rich woods and streambanks; scarce (00675).

#### ORCHIDACEAE

*Corallorrhiza wisteriana* Conrad, rich wooded streambank; very rare (not collected).

†*Cypripedium parviflorum* Salisb. var. *pubescens* (Willd.) Knight, rich wooded ravine; very rare (00699).

†*Goodyera pubescens* (Willd.) R.Br. ex Ait.f., rich stream terrace; very rare (04293).

†*Liparis liliifolia* (L.) Rich. ex Ker Gawl., rich wooded slope and stream terrace; rare (not collected).

†*Platanthera clavellata* (Michx.) Luer, mossy, rocky streamside; very rare (02678).

†*Platanthera peramoena* (A. Gray) A. Gray, wooded alluvial terrace and streambank; rare (02533).

†*Spiranthes tuberosa* Raf., upland oak-hickory forest; rare (01150).

†*Tipularia discolor* (Pursh) Nutt., rich woods; infrequent (00895).

#### POACEAE

†*Agrostis perennans* (Walter) Tuckerman, upland woods; frequent (01169).

\**Agrostis stolonifera* L., old field and disturbed site; infrequent (00704).

- †*Andropogon gerardii* Vitman, old field at edge of oak-hickory forest; very rare (02962).
- Andropogon virginicus* L. var. *virginicus*, old field; common (01541).
- †\**Anthoxanthum odoratum* L., old field; infrequent (02162).
- †\**Arthraxon hispidus* (Thunb.) Makino, disturbed site; scarce (not collected).
- †*Arundinaria gigantea* (Walter) Muhl., wooded streamside terrace; rare (01547).
- \**Avena sativa* L., disturbed site; very rare (02243).
- Brachyelytrum erectum* (Schreb.) Spreng. ex Beauv., rich woods; frequent (00691).
- †\**Bromus commutatus* Schrad., disturbed site, infrequent (00702).
- \**Bromus japonicus* Thunb. ex Murr., old field; infrequent (02166).
- Bromus pubescens* Muhl. ex Willd., rich woods and streambanks; infrequent (00577 VDB).
- Chasmanthium latifolium* (Michx.) Yates, woods and streambanks; occasional (01358).
- †*Cinna arundinacea* L., rich woods and wet streambanks; infrequent (01546).
- \**Cynodon dactylon* (L.) Pers., disturbed site; rare (01408 VDB).
- †\**Dactylis glomerata* L., old field; infrequent (00706).
- Danthonia spicata* (L.) Beauv. ex Roemer. & Schult., oak-hickory forest; frequent (00749).
- Dichanthelium acuminatum* (Sw.) Gould & C.A.Clark var. *acuminatum*, old field; occasional (00618).
- Dichanthelium boscii* (Poir.) Gould & C.A.Clark, dry to mesic woods; occasional (00751).
- †*Dichanthelium clandestinum* (L.) Gould, margin of woods and old field; infrequent (00698).
- Dichanthelium commutatum* (Schult.) Gould, dry to mesic woods and streambanks; common (00532).
- †*Dichanthelium dichotomum* (L.) Gould. var. *dichotomum*, dry oak-hickory forest; common (00750).
- †*Dichanthelium dichotomum* (L.) Gould. var. *ramulosum* (Torr.) R.J.LeBlond, moist streambanks; occasional (01059).
- Dichanthelium laxiflorum* (Lam.) Gould, dry woods; common (00629).
- Dichanthelium malacophyllum* (Nash) Gould, old field; rare (01039).
- †*Dichanthelium scoparium* (Lam.) Gould, old field; rare (02234).
- †*Dichanthelium sphaerocarpon* (Elliott) Gould var. *isophyllum* (Scribn.) Gould & C.A.Clark, old field and wooded streambanks; infrequent (02544).
- †*Dichanthelium yadkinense* (Ashe) Mohlenbr., moist to wet streambanks and calcareous seeps; scarce (00685).
- †*Digitaria ciliaris* (Retz.) Koeler, disturbed site; rare (01407).
- \**Digitaria ischaemum* (Schreb.) Schreb. ex Muhl., disturbed site; rare (02944).
- \**Echinochloa colona* (L.) Link, moist depressions along road; rare (02529).
- †\**Echinochloa crus-galli* (L.) Beauv., moist depressions along road; rare (01074).
- †*Elymus hystrix* L., woods and streambanks; occasional (00679).
- †*Elymus macgregorii* R.E.Brooks & J.J.N.Campbell, rich wooded streambank; scarce (not collected).
- †*Elymus villosus* Muhl. ex Willd., dry woods and banks; occasional (00854).
- Elymus virginicus* L. var. *virginicus*, woods and edges of disturbed sites; occasional (00697).
- †*Eragrostis spectabilis* (Pursh) Steud., old field; infrequent (01295).
- Festuca subverticillata* (Pers.) Alexeev, wooded streambanks and terraces; infrequent (02609).
- Glyceria striata* (Lam.) Hitchc., wet streambanks and calcareous seeps; occasional (00672).
- †*Hordeum pusillum* Nutt., disturbed site; rare (02178).
- Leersia virginica* Willd., moist streambanks and seeps; occasional (02960).
- †\**Lolium arundinaceum* (Schreb.) Darbysh., old field, road edges; common (00705).
- †\**Lolium perenne* L. ssp. *multiflorum* (Lam.) Husn., old field and disturbed site; occasional (00547).
- Melica mutica* Walter, limestone bluffs and rocky woods; occasional (00391).
- †\**Microstegium vimineum* (Trin.) A.Camus, moist alluvial terraces, calcareous seeps, and gravel bars in streams; frequent (00671).
- †*Muhlenbergia schreberi* J.F.Gmel., disturbed site; scarce (01378).



- Muhlenbergia sylvatica* Torr. ex A. Gray, woods, streambanks, and calcareous seeps; frequent (02720).
- †*Panicum anceps* Michx., old field; common (00881).
- †*Panicum dichotomiflorum* Michx. var. *dichotomiflorum*, wet road ruts; rare (02939).
- †*Paspalum dilatatum* Poir., old field and disturbed site; infrequent (04269).
- Paspalum setaceum* Michx., old field; infrequent (02964).
- †*Phleum pratense* L., disturbed site; rare (03497).
- \**Poa annua* L., disturbed site; rare (01984 VDB).
- †*Poa autumnalis* Muhl. ex Elliott, Moist woods, bluffs, and streambanks; frequent (00524).
- †*Poa chapmaniana* Scribn., old field; rare (02220 VDB).
- †*Poa compressa* L., disturbed site; rare (01978).
- †*Poa pratensis* L., old field; occasional (04519).
- Poa sylvestris* A. Gray, moist woods, bluffs, and streambanks; occasional (00527).
- †*Saccharum alopecuroidum* (L.) Nutt., old field; occasional (01399).
- †*Saccharum giganteum* (Walter) Pers., old field, rare (01583).
- Schizachyrium scoparium* (Michx.) Nash var. *scoparium*, old field and in thin oak-hickory forests; occasional (01542).
- †*Setaria faberi* Herrm., disturbed site; rare (02528).
- †*Setaria parviflora* (Poir.) Kerguelen, old field; occasional (01345).
- †*Sorghastrum nutans* (L.) Nash, old field; very rare (03506).
- †*Sorghum halapense* (L.) Pers., old field and disturbed site; infrequent (02526).
- †*Sphenopholis nitida* (Biehler) Scribn., woods; occasional (01983).
- Tridens flavus* (L.) Hitchc. var. *flavus*, old field; frequent (01040).
- \**Triticum aestivum* L., disturbed site; very rare (02245).
- †*Vulpia octoflora* (Walter) Rydb. var. *octoflora*, dry soil in old field; very rare (01980).

#### SMILACACEAE

- Smilax bano-nax* L., dry wooded slope; scarce (00719).
- †*Smilax ecirrata* (Engelm. ex Kunth) S. Watson, rich wooded streambank; very rare (01158).
- †*Smilax glauca* Walter, dry woods and thickets; common (00694).
- Smilax rotundifolia* L., dry woods and thickets; common (00542).
- †*Smilax tamnoides* L., rich woods; infrequent (00842).

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#### REFERENCES

- ACKERMAN, E.A. 1941. The Köppen classification of climates in North America. *Geogr. Rev.* 31:105–111.
- BASKIN, J.M., C.C. BASKIN, and E.W. CHESTER. 1994. The Big Barrens region of Kentucky and Tennessee: further observations and considerations. *Castanea*, 59:226–254.

- BRAUN, E.L. 1950. Deciduous forests of eastern North America. Hafner Publ. Co., New York.
- BRYANT, W.S., W.C. McCOMB, and J.S. FRALISH. 1993. Oak-hickory forests (Western Mesophytic/oak-hickory forests). In: W.H. Martin, S.G. Boyce, and A.C. Echternacht, eds. Biodiversity of the southern United States: upland terrestrial communities. John Wiley and Sons, New York. Pp. 143–201.
- CAMPBELL, J.J.N. 2000. Notes on North American *Elymus* species with paired spikelets I: *E. macgregorii* sp. nov. and *E. glaucus* ssp. *mackenzii* comb. nov. *J. Kentucky Acad. Sci.* 61: 88–98.
- CARPENTER, J.S. and E.W. CHESTER. 1987. Vascular flora of the Bear Creek Natural Area, Stewart County, Tennessee. *Castanea* 52:112–128.
- CHESTER, E.W. 1986. The vascular flora of Barnett Woods Natural Area, Montgomery County, Tennessee. *J. Tennessee Acad. Sci.* 61:24–28.
- CHESTER, E.W. 1993. Vascular flora of Land Between the Lakes, Kentucky and Tennessee: an updated checklist. *J. Tennessee Acad. Sci.* 68:1–14.
- CHESTER, E.W. 1995. An overview of forest diversity in the Interior Low Plateaus Physiographic Province. In: T.D. Landis and B. Cregg, tech. Cords. National Proceedings, Forest and Conservation Nursery Associations. USDA Forest Service, Pacific Northwest Research Station, Gen. Tech. Rep. PNW-GTR-365. Pp. 109–115
- CHESTER, E.W., B.E. WOFFORD, R. KRAL, H.R. DE SELM, and A.M. EVANS. 1993. Atlas of Tennessee vascular plants. Vol. 1. Pteridophytes, gymnosperms, angiosperms: monocots. Misc. Publ. No. 9. Center for Field Biology, Austin Peay State Univ., Clarksville, Tennessee.
- CHESTER, E.W., B.E. WOFFORD, and R. KRAL. 1997. Atlas of Tennessee vascular plants, Vol. 2. Angiosperms: dicots. Misc. Publ. No. 13. Center for Field Biology, Austin Peay State Univ., Clarksville, Tennessee.
- CLEMENTS, R.K. and B.E. WOFFORD. 1991. The vascular flora of Wolf Cove, Franklin County, Tennessee. *Castanea* 56:268–286.
- CRONQUIST, A. 1980. Vascular flora of the southeastern United States, Vol. 1. Asteraceae. Univ. North Carolina Press, Chapel Hill, North Carolina.
- DE SELM, H.R. 1988. The barrens of the Western Highland Rim of Tennessee. In: D.H. Snyder, ed. Proceedings of the first annual symposium on the natural history of lower Tennessee and Cumberland River valleys. Center for Field Biology, Austin Peay State Univ., Clarksville, Tennessee. Pp. 199–219
- DE SELM, H.R. 1994. Tennessee barrens. *Castanea* 59:214–225.
- FERNALD, M.L. 1950. Gray's manual of botany, 8<sup>th</sup> edition. American Book Co., New York.
- FLEMING, C. 2004. The vascular flora of Fall Creek Falls State Park, Van Buren and Bledsoe counties, Tennessee. *Castanea* 69:164–184.
- FLORA OF NORTH AMERICA EDITORIAL COMMITTEE (eds.). 1993. Flora of North America north of Mexico. Volume 2. Pteridophytes and gymnosperms. Oxford University Press, New York, New York.
- GARRETT, J.K. 1966. Footprints in stone. First Farmers & Merchants National Bank, Columbia, Tennessee.

- GLEASON, H.A. and A. CRONQUIST. 1991. Manual of the vascular plants of northeastern United States and adjacent Canada, 2nd edition. New York Botanical Garden, Bronx, New York.
- GRIFFITH, G.E., J.M. OMERNIK, and S.H. AZEVEDO. 1998. Ecoregions of Tennessee (Two-sided color poster with map, descriptive text, summary tables, and photographs). US Geological Survey, Reston, Virginia. Scale 1:940,000.
- HARMON, A.B. JR., E. LUSK, J. OVERTON, J.H. ELDER JR., and L.D. WILLIAMS. 1959. Soil survey of Maury County, Tennessee. US Dept. Agriculture, Washington, DC.
- HOUCK, D.F. 1990. Vascular flora of Red Clay State Historical Area, Bradley County, Tennessee. *J. Tennessee Acad. Sci.* 65:75–82.
- ISELY, D. 1990. Vascular flora of the southeastern United States, Vol. 3, Part 2. Leguminosae (Fabaceae). Univ. North Carolina Press, Chapel Hill, North Carolina.
- JONES, R.L. 1994. The status of *Helianthus eggertii* Small in the southeastern United States. *Castanea* 59:319–330.
- JOYNER, J.M. and E.W. CHESTER. 1994. The vascular flora of Cross Creeks National Wildlife Refuge, Stewart County, Tennessee. *Castanea* 59:117–145.
- KARTESZ, J.T. 1999. A synonymized checklist and atlas with biological attributes for the vascular flora of the United States, Canada, and Greenland, 1st ed. In: J.T. Kartesz and C.A. Meacham. Synthesis of the North American Flora, Version 1.0. North Carolina Botanical Garden, Chapel Hill, North Carolina.
- KÜCHLER, A.W. 1964. Vegetation maps of North America: potential natural vegetation of the conterminous United States. *Am. Geograph. Soc. Spec. Publ.* 36.
- LEBLOND, R.J. 2001. Taxonomy of the *Dichotoma* group of *Dichanthelium* (Poaceae). *Sida* 19:821–837.
- MANN, L.K., T.S. PATRICK, and H.R. DESELME. 1985. A checklist of the vascular plants on the Department of Energy Oak Ridge Reservation. *J. Tennessee Acad. Sci.* 60:8–13.
- MARCHER, M.V. and R.E. LOUNSBERRY. 1966. Geologic map of the Summertown Quadrangle, Tennessee. Tennessee Div. Geol., Nashville, Tennessee.
- McKINNEY, L.E. 1986. The vascular flora of Short Mountain (Cannon County) Tennessee. *J. Tennessee Acad. Sci.* 61:20–24.
- MURRELL, Z.E. and B.E. WOFFORD. 1987. Floristics and phytogeography of Big Frog Mountain, Polk County, Tennessee. *Castanea* 52:262–290.
- NACZI, R.F.C., C.T. BRYSON, and T.S. COCHRANE. 2002. Seven new species and one new combination in *Carex* (Cyperaceae) from North America. *Novon* 12:508–532.
- NACZI, R.F.C., R. KRAL, and C.T. BRYSON. 2001. *Carex cumberlandensis*, a new species of section *Careyanae* (Cyperaceae) from the eastern United States of America. *Sida* 19:993–1014.
- OSTRY, M.E. 1997. Butternut canker: history, biology, impact, and resistance. In: J.W. Van Sambeek, ed. Knowledge for the future of black walnut. USDA Forest Service, North Central Forest Experiment Station, Gen. Tech. Rep. NC-191. Pp. 192–199.
- QUARTERMAN, E., and R.L. POWELL. 1978. Potential ecological/geological natural landmarks on the Interior Low Plateaus. US Dept. Interior, Washington, DC.
- RADFORD, A.E., H.E. AHLES, and C.R. BELL. 1968. Manual of the vascular flora of the Carolinas. Univ. North Carolina Press, Chapel Hill, North Carolina.

- SCHMALZER, P.A., T.S. PATRICK, and H.R. DE SELM. 1985. Vascular flora of the Obed Wild and Scenic River, Tennessee. *Castanea* 50:71–88.
- SHANKS, R.E. 1958. Floristic regions of Tennessee. *J. Tennessee Acad. Sci.*, 33:195–210.
- SMALL, J.K. 1933. *Manual of the southeastern flora*. Univ. North Carolina Press, Chapel Hill, North Carolina.
- TENNESSEE EXOTIC PEST PLANT COUNCIL. 2002. Invasive exotic pest plants in Tennessee. *J. Tennessee Acad. Sci.* 77:45–48.
- TENNESSEE NATURAL HERITAGE PROGRAM. 2001. Tennessee rare plant list. Tennessee Division of Natural Heritage, Dept. Environ. Conserv., Nashville, Tennessee.
- TENNESSEE VALLEY AUTHORITY. 1938. *The scenic resources of the Tennessee Valley: a descriptive pictorial inventory*. Tennessee Valley Authority, Dept. Regional Planning Studies, Knoxville, Tennessee.
- THOMAS, R.D. 1976. The vascular flora of Chilhowee Mountain, Blount and Sevier counties, Tennessee. *J. Tennessee Acad. Sci.* 51:118–123.
- TURNER, W.B. 1955. *History of Maury County, Tennessee*. Parthenon Press, Nashville, Tennessee.
- USDA, NRCS. 2004. The PLANTS Database, version 3.5 ([plants.usda.gov](http://plants.usda.gov)). National Plant Data Center, Baton Rouge, Louisiana [as accessed December 16, 2004].
- US FISH AND WILDLIFE SERVICE. 1993. Recovery plan for *Apios priceana*. US Fish and Wildl. Service, Jackson, Mississippi.
- WOFFORD, B.E. and R. KRAL. 1993. Checklist of the vascular plants of Tennessee. *Sida, Bot. Misc.* No. 10.
- WOFFORD, B.E., T.S. PATRICK, L.R. PHILLIPPE, and D.H. WEBB. 1979. The vascular flora of Savage Gulf, Tennessee. *Sida* 8:135–151.
- YATSKIEVYCH, G. 1999. Steyermark's flora of Missouri, Vol. 1. Revised edition. Missouri Botanical Garden, St. Louis.